Universiti Teknologi MARA

STATIC IMAGE OF HAND GESTURE FOR NUMERICAL SIGN LANGUAGE RECOGNITION SYSTEM USING BACKPROPAGATION NEURAL NETWORK

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Thesis submitted in fulfillment of the requirements for
Bachelor of Science (Hons) Intelligent System
Faculty of Information Technology And
Quantitative Sciences

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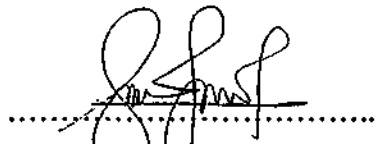
DECLARATION

Here is to declare that I am responsible for the work submitted in this project with all the word, facts and relevant printed material are fully under my own except several finding as specified in the references that each of their sources has been stated.



May 4th, 2007

ERMAN BIN IBRAHIM

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APPROVAL

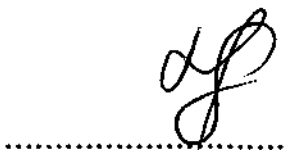
STATIC IMAGE OF HAND GESTURE FOR NUMERICAL SIGN LANGUAGE RECOGNITION SYSTEM USING BACKPROPAGATION NEURAL NETWORK

BY

ERMAN BIN IBRAHIM

This thesis was prepared under the direction of thesis supervisor, Puan Norzehan Sakamat. It was submitted to the School of Information Technology and Quantitative Sciences and was accepted in partial fulfillment of the requirements for the degree of Bachelor of Science Honors Intelligent System.

Approved by:



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Date: 4th May, 2007

Puan Norzehan Sakamat
Thesis Supervisor

ABSTRACT

This project is about recognizing hand gesture for sign language using backpropagation (BP) algorithm that is one of the training algorithms used in the Artificial Neural Network (ANN). A study on the research and development of the previous project based on pattern recognition has been done as a result selected; method, theory and techniques will be gathered in order to perform a hand gesture for sign language recognition system. The useful information can be used as a basic idea towards project methodology whereby a detail development process presented. Hand images are gathered from ten (10) selected persons using digital camera (2.0 mega pixels) and for purpose of the study frontal view is only hand area covered. The image processing tools are used to process the image with regards to enhance the image and to extract useful information. The useful information will be fed to the ANN whereby the BP training algorithm will be performed in order to extract the knowledge of the image that is the final weight. To ensure the performance of the system, a number of experiments are done by adjusting the parameters of the BP training algorithm. The result of the experiment shows the percentage of successful recognition. Finally, the BP algorithm has been prove as a method that can be used for recognizing hand gesture for sign language and the successful task of recognition also dependent an the image processing. As a result, the two layer networks with 2500 input neurons, 50 hidden neurons and 3 output neurons. In the end of research project period, found out that the result from both neural network models is excellent where the accuracy rate for the first network is 96. 25% and for the second network is 80%. Therefore all of the objectives in this research project have been achieved.

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